

element having a longitudinal ferrule spring force f_n , with n being the number of ferrule springs, the connector system comprising:

a substrate housing assembly mounted on the substrate including
at least one ferrule receiving feature for receiving the optical fiber ferrule, and
a substrate spring assembly, the substrate housing assembly having a second longitudinal range of motion, the substrate spring assembly biasing forward the housing assembly along the second longitudinal range of motion and having a longitudinal spring force h , wherein

$$1. \quad h > \sum_1^n f_n ;$$

Claim
a backplane housing assembly defining at least one longitudinal receiving cavity configured to mate with the ferrule receiving feature, the receiving cavity having a frontal opening along the first surface of the backplane and a rear opening along the second surface of the backplane, wherein when the substrate is placed in a mating position with respect to the backplane, the substrate spring assembly maintains the backplane housing and the substrate housing in housing mating positions with respect to each other.

14. The connector system of claim 13, wherein the substrate spring assembly comprises a first and a second laterally spaced suspension spring members, the first and second suspension spring members allowing a range of angular movement of the housing assembly with respect to the substrate.
15. The connector system of claim 13, wherein the spring assembly comprises a plurality of individual housing spring members exerting a plurality of longitudinal spring forces, wherein in the housing mating position the ferrules abut against respective opposing connecting ferrules, the summation of the forward longitudinal spring forces of the individual housing spring members is greater than the summation of the backward longitudinal spring forces exerted by the ferrule spring members on the opposing connecting ferrules.

16. The connector system of claim 13, wherein the substrate spring assembly allows for the housing assembly a measure of angular rotation with respect to the substrate, wherein the substrate spring assembly corrects a measure of angular misalignment between the substrate and the backplane to allow coupling of the backplane housing assembly and the substrate housing assembly.
17. The connector system of claim 13, the backplane housing assembly further including a frontal door covering the frontal opening.
18. The connector system of claim 13, the backplane housing assembly further including a rear door covering the rear opening.
19. The connector system of claim 17, wherein the door provides electromagnetic containment.
20. The connector system of claim 17, wherein the door automatically closes when the backplane housing assembly is not mated.
21. The connector system of claim 13, the substrate housing assembly comprising a plurality of stacked ferrule receiving features, the backplane housing assembly including a corresponding number of corresponding receiving cavities.
22. A connector system for connecting a plurality of optical fiber cables on a slidable card through a generally orthogonally disposed backplane, each optical fiber cable having a terminating ferrule, the longitudinal orientation of optical fibers within the terminating ferrule defining a longitudinal axis and a forward direction, each ferrule having a longitudinal range of motion with respect to the optical fiber cable and a forward biasing ferrule spring element having a longitudinal ferrule spring force, the optical connector system comprising:
 - a card housing assembly including
 - at least one ferrule receiving cavity for receiving the optical fiber ferrule, and
 - a spring assembly, wherein the spring assembly couples the card housing assembly to the card;

wherein the card housing assembly has a longitudinal range of motion, the spring assembly biasing the housing assembly along the second longitudinal range of motion in a forward direction and having a longitudinal housing spring force, wherein the summation of the forward longitudinal housing spring forces is greater than the summation of the backward longitudinal spring forces exerted by the ferrule spring elements.

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23. A backplane connector assembly for making optical connections through a backplane, the connector assembly comprising
 - a backplane housing defining at least one longitudinal receiving cavity through the backplane, the receiving cavity having a frontal opening along the front surface of the backplane member configured to receive a first optical connector and a rear opening along the back surface of the backplane member configured to receive a second optical connector;
 - a foldable frontal door at least partially covering the frontal opening; and
 - a foldable rear door at least partially covering the rear opening;
 wherein the doors automatically close when an optical connector member is not placed in the respective opening, wherein the front door and the rear door operate independently from each other.
 24. The backplane connector assembly of claim 22, wherein at least one of the doors includes an electrically conductive material and the door is electrically grounded.
 25. The backplane connector assembly of claim 24, wherein the backplane housing includes a dielectric material and is not electrically conductive.
 26. The backplane connector assembly of claim 22, wherein the backplane housing is electrically conductive and is electrically grounded and the doors are non electrically conductive.
 27. The backplane connector assembly of claim 22, wherein the doors comprise a foldable spring design that folds into the opening when a connector is inserted into the opening.

28. The backplane connector assembly of claim 22, wherein the doors comprise a spring biased element coupled to a hinge element.
29. The backplane connector assembly of claim 22, wherein the backplane housing defines a plurality of linearly stacked receiving cavities.
30. The backplane connector assembly of claim 29, wherein the doors comprise pairs of spring biased element coupled to a hinge element, each spring biased element covering one opening.
31. The backplane connector assembly of claim 22, wherein the backplane housing includes frame features that assure a tight fit of the doors within the opening in a closed position.
32. A bend radius control member for controlling the bend radius of an optical fiber cable comprising a deformation resistant heat-shrunk outer jacket wrapped around the optical fiber cable, wherein the heat-shrunk outer jacket has a desired bend radius curvature.
33. A method for controlling the bend radius of at least a portion of an optical fiber cable having at least one optical fiber, the method comprising the steps of:
 providing a jacket of a heat shrinkable-material;
 placing the jacket around the portion of the optical fiber cable;
 bending the portion of the optical fiber cable at a desired bend angle; and
 shrinking the jacket around the optical fiber cable by the application of heat
34. The method of claim 33, wherein the step of bending includes bending the portion of the optical fiber cable in at least two curves.
35. The method of claim 34, wherein the curves are in different planes.
36. The method of claim 33, the step of bending the optical fiber cable comprising the steps of: